

# High-Speed Wireless Access to the Internet

Metricom's Ricochet<sup>TM</sup> Service

Dr. Mike Ritter

MWRitter@metricom.com

Chief Technology Officer

Metricom, Inc.; Los Gatos CA

[www.ricochet.net](http://www.ricochet.net)

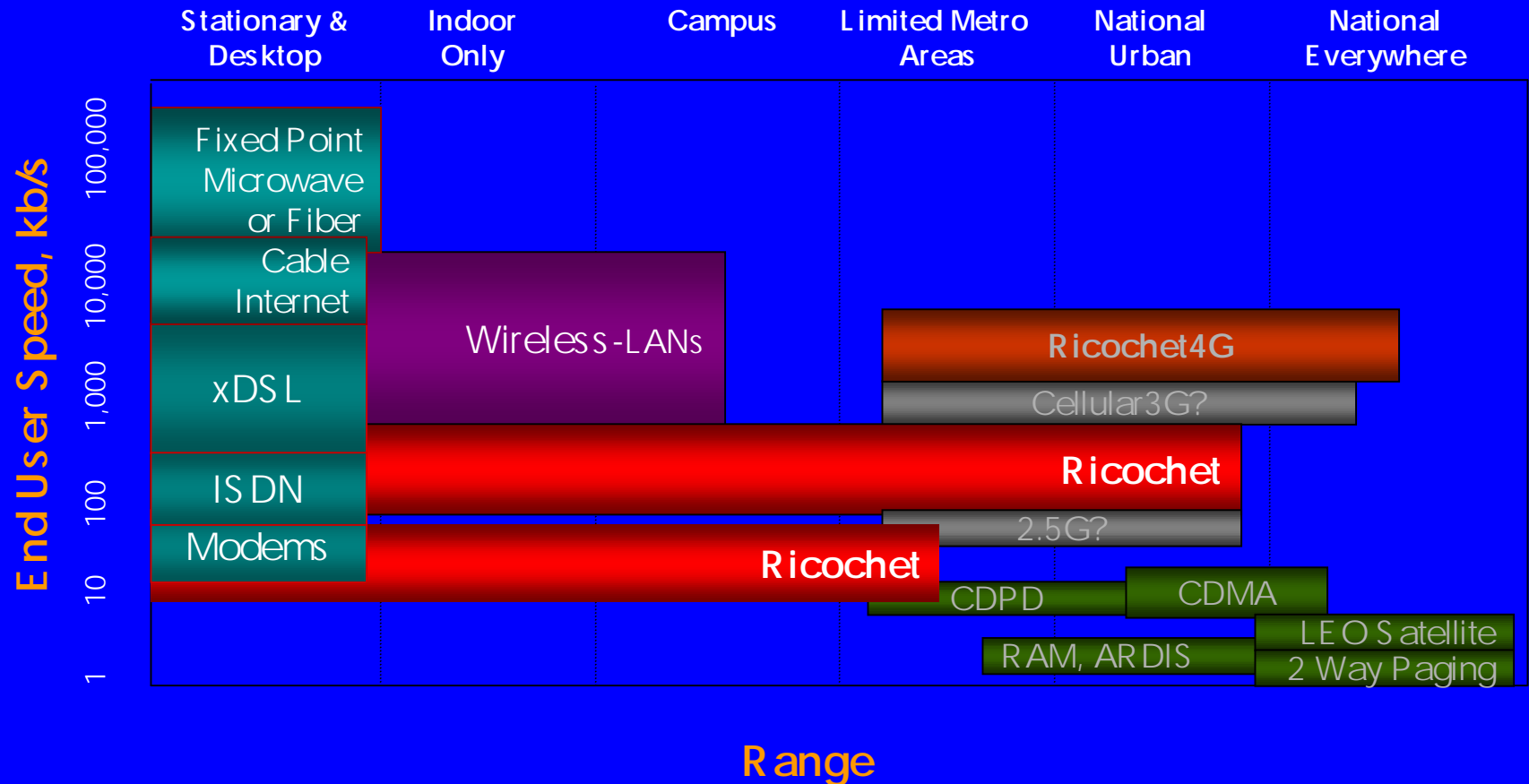
# Why Wireless Internet?

- Freedom from the Office
- Leave Your Desk Behind
- Freedom to Work
  - Any Time You Want
  - Any Where You Want
- Access to Information While Mobile

Wireless Internet  
Sets You Free



# Wireless Internet



What's available now, next year, and the future.

# How Big is Wireless Internet?

All Arrows Pointing Up

**\$20-25  
Billion**

**Mobile Data  
Service  
business  
by  
2007**

SalomonSmith  
Barney

**20 million**

**Mobile  
Data  
Users  
by  
2004**

The  
Yankee Group

**20 million**

**Mobile  
Data  
Subs  
by  
2004**

The  
Strategis Group

**36 million**

**Wireless  
Data  
Subs  
by  
2003**

Dataquest

30 November 1999

Metricom's Ricochet™ Wireless Service

# **About Metricom and its Ricochet Wireless Service**

The Internet Experience  
Any where, Any time



# Metricom's Business

*Metricom designs, provisions, and operates wireless digital networks and services for mobile users*

Using Unlicensed Spectrum  
to Deliver High-Speed,  
Wireless, Mobile Access



# Ricochet Wireless Internet

*Replicate Your Desktop Anywhere*

Always On  
High-Speed  
Low, Fixed Cost  
Secure and Reliable





# Ricochet Services

## ■ Current Service

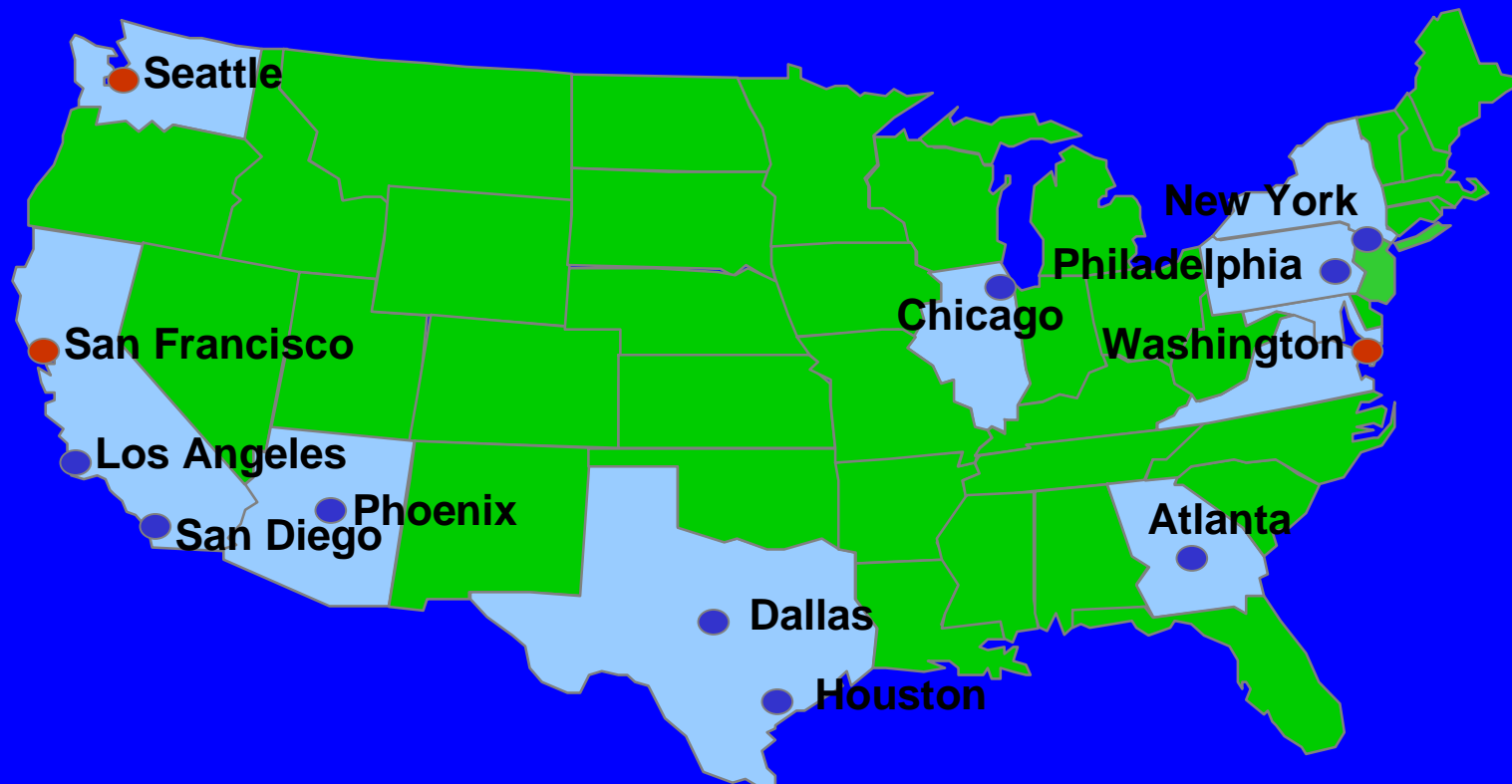
- Up to 28.8+ kb/s
- 30,000+ Subscribers in 3 Major Markets
  - Silicon Valley and the SF Bay Area; Seattle; Washington, DC
  - 12 Major Airports, parts of Manhattan & Los Angeles
  - Coverage maps available at our website:  
[www.ricochet.net](http://www.ricochet.net)

## ■ Next Generation

- 128 kb/s and more coverage areas



# 128 kb/s Availability



12 Markets Summer 2000  
Over 40 Markets by mid-2001  
Over 100 million People

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# Ricochet “MicroCells” Install on Streetlights



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# Ricochet

## The High-Speed Architecture

Wireless  
Modem

128 kb/s  
Speeds

900 MHz

Public  
Spectrum  
"Part 15"  
WAP

2.4 GHz

2.3 GHz  
(or 2.4 GHz)

MCDN™ Mesh  
of Dual-Band  
"Part 15"  
MicroCells

Licensed  
Spectrum  
"WCS" WAP

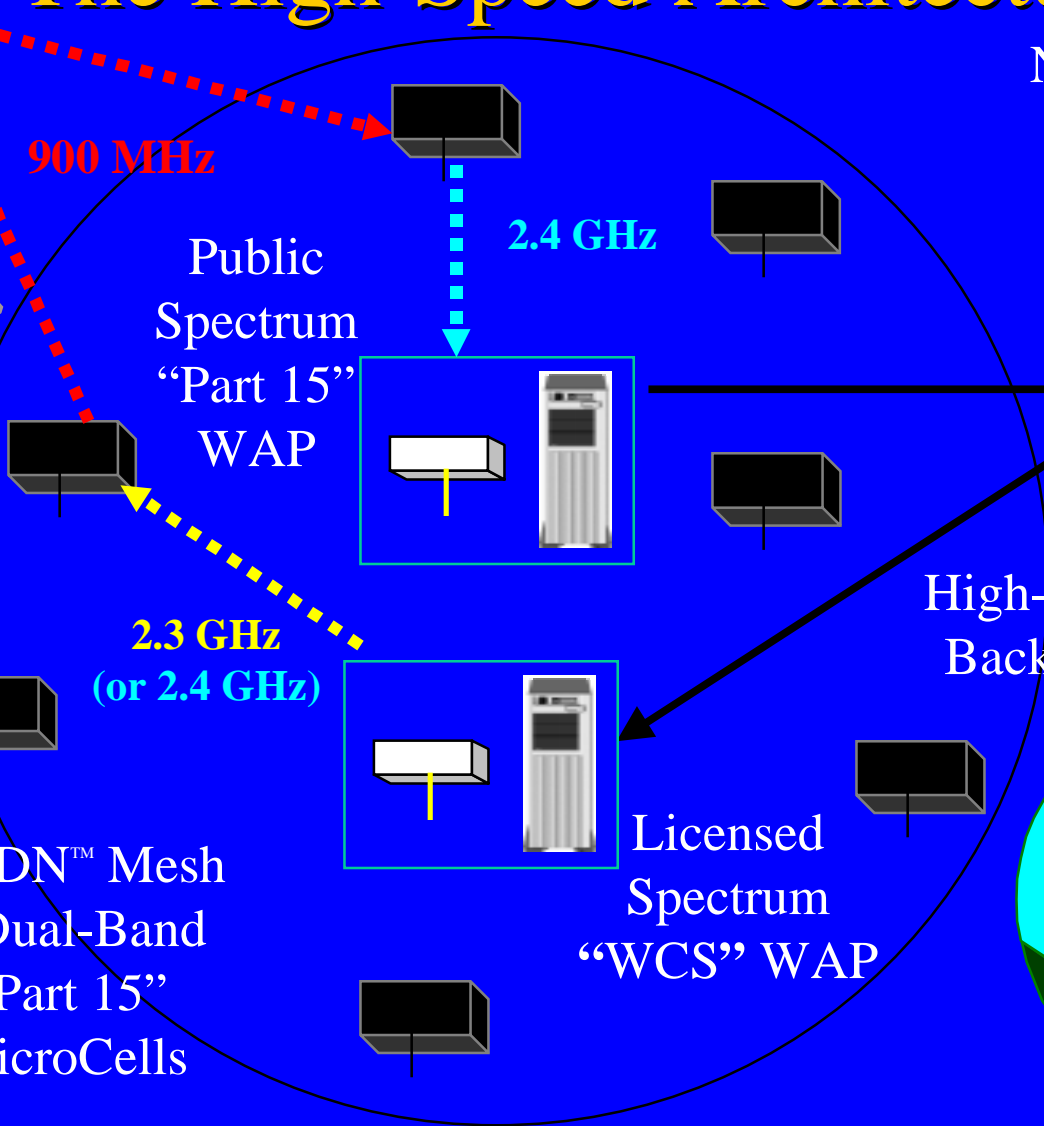
Network Interface  
Facility (NIF)

High-Speed  
Backbone

Internet

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# Part 15 Unlicensed Spectrum

- Allows for innovation
  - Last place to develop RF device in a garage
- Part 15 is an extremely efficient use of spectrum
  - Part 15 devices operate in shared spectrum
    - Must not cause interference to...
    - Must accept interference from...
      - ALL OTHER SERVICES
- Unlicensed operation expects interference
  - Equipment must be designed to operate despite interference




# Sharing Public (Part 15) Spectrum

- Part 15.247 requires low power, spread spectrum techniques
- Originally used by the military to hide transmissions and overcome interference
- Transmissions look like random noise to other radios
- Allows multiple, overlapping users
- Efficient spectrum usage through sharing
  - compared to older technologies which are not built to tolerate interference



# How does Frequency Hopping Spread Spectrum Work?

- Heddy Lamar invented the idea of frequency hopping using a piano and filed the first patents during WWII
- Each transmitter sends small bursts of data on many different frequencies (frequency hopping)
- A receiver listens in synchronization with the transmitter's frequency hopping pattern to isolate the data from that one transmitter
- Many conversations can be going on at the same time



# MicroCellular Concept Frequency Reuse

- Low power with spread spectrum allows many small, overlapping cells
- Low power provides huge amounts of capacity as distant cells can reuse the spectrum
- Spread spectrum allows the cells to overlap each other, further increasing the capacity



# Regulatory Framework

Can Ricochet service be available  
in my area?

# It Will Be, If the FCC Continues to Assure

- Adequate unlicensed spectrum
  - More spectrum allows capacity and speed
- Simple rules
  - Intelligent networks and radios, not massive etiquettes
- Reasonable occupants
  - Need simple rules to ensure good neighbors
- Regulatory stability
  - Commitment to support and protect unlicensed, shared spectrum allocations



# Ricochet Also Requires Access to Rights-of-Way

- We need to place antennas and radios along public rights-of-way
- We need uniform regulations for guaranteed access to public rights-of-way
- Uniform regulations would benefit the public by
  - Speeding up deployment
  - Lowering the cost of service



# Ricochet Facts

- Fast
- Affordable
- Compatible
- Transportable
- Secure
- 1-800-GO-WIRELESS
- [www.ricochet.net](http://www.ricochet.net)